Robertsomyia an Aberrant New Genus of Phytalmiini from Papua New Guinea (Tephritidae: Diptera)[1]

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ABSTRACT

A remarkable new genus and species, *Robertsomyia paradoxa,* is described from Papua New Guinea and the Characteristics of the tribe Phytalmiini are discussed.

A strange species of fly on hand has the general facies of Phytalmiini, especially *Sessilina* McAlpine and Schneider, but some of its features are so unusual that it does not conform with the presently accepted concepts of the family Tephritidae. It fits here by having 2 breaks in costa; 2nd antennal segment with a dorsal cleft; female with 7th tergum and sternum fused laterally forming ovipositor sheath and male genitalia having the tephritid characteristics. It departs drastically from the typical family concepts by lacking all head and body bristles, including lack of apicoventral spines on middle tibiae; vein Sc straight, not upcurved at apex; wing base very narrow, with anal cell greatly reduced and alula lacking; cell Cu not lobed, last section of vein Cu vertical or but slightly oblique; wing veins bare and no costal bristles at end of vein Sc.

McAlpine and Schneider (1978) reviewed the Tribe and defined its characteristics as follows: "Flies of slender habitus; outer vertical bristles reduced or absent; one incurved lower fronto-orbital bristle and one upper reclinate fronto-orbital, both rather weak (sometimes a hair-like vestige of second upper fronto-orbital); arista plumose to pectinate, with a dorsal, an anterior, and usually a less developed ventral series of hairs; metathoracic postcoxal bridge broadly sclerotized; scutellum rather short, with one pair of distinct bristles (apical to subapical); the following thoracic bristles absent: humeral, presutral, dorso-central (except in *Sessilina horrida),* prescutellar acrostichal, sterno-pleural; pleurotergite without long hairs; second segment of mid and hind tarsi with sharply defined, bare, shining basal area; wing narrowed basally; subcosta approaching costa at a markedly acute angle; acute lobe of anal cell very short; costa without any enlarged bristle at the distal break (at junction with subcosta); stem vein (base of R) not setulose before node (in contrast to *Dacus* F. and *Adrama* Walker); segment seven of ♀ postabdomen (ovipositor sheath) long and tapering, with tergite and sternite separated by distinct suture, and spiracles in sternite close to anterior extremity (these characters in contrast to *Adrama);* ♂ with vanes of aedeagal apodeme fused to form a ventrally directed Y-shaped process, with rather long stem and relatively short divergent arms. This last character is the most distinctive one of the tribe and, to our knowledge, is not found elsewhere in the Tephritidae. In *Dacus s.l.* and *Adrama,* the vanes arise separately from the axis of the apodeme. We therefore consider the nature of the apodome to be crucial in deciding the location of genera in the Phytalmiini."

The taxon on hand fits the general characteristics of Phytalmiini, especially *Sessilina* McAlpine and Schneider and conforms with most of the characters given

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above including the presence of a broadly sclerotized postcoxal bridge on metathorax; short scutellum; bare pleuroterga; basally narrow wings; cell Cu vertical or slightly oblique at apex, not distinctly lobate; costal spines absent; base of R not setose before node; aristae pectinate, with dorsal rays but with none on anterior or ventral surfaces except for short hairs at base; female with 3 round spermathecae and spiracles situated near base of segment. Scutellum shaped as in typical Phytalmiini and with a pair of prominent apical tubercles which typically should bear a pair of strong bristles. Wings similar in shape but much narrower basally with anal cell greatly narrowed and alula lacking (Fig. 1i); 2nd costal section even more acute at apex with vein Sc straight, not upcurved at apex and apical portion of cell Cu only very slightly oblique, forming about an 85 degree angle. It differs from the concept of this tribe established by McAlpine and Schneider by lacking all head and body bristles, including no apical spines on middle tibiae; having no sharply defined, bare, shining areas at bases of 2nd tarsomeres of mid and hind legs; 7th tergum and sternum of female apparently fused, with lateral margins very sharp edged (I question the interpretation of this character. In the Phytalmiini I have studied I have not been able to demonstrate that the 7th tergum and sternum are separated.); also vanes of aedeagal apodeme in male widely forked, rather than fused.

The significance of the male genital characters, especially the development of the aedeagal apodeme, is very poorly understood. I find that most genera of the tribe Acanthonevrini, especially those in the grouping with 6 scutellar bristles, have the vanes of the apodeme fused to form a ventrally directed Y-shaped process. In comparing these with species of *Phytalmia* Gerstaecker I see no differences. I see no alternative but to place this new taxon in *Phytalmiini.* The significance of the shining bare area on dorsobasal portion of 2nd tarsomeres of mid and hind legs of both sexes is not understood. I see a definite intergradation in the materials I have studied from poorly developed in *Sessilina* Osten Sacken, moderately developed in *Diplochorda* Osten Sacken and well developed in *Phytalmia* Gerstaecker (Figs. 1a, 1b, & 1c). This area is not developed in the new taxon and the base of the 2nd tarsomere is bare only at the point of articulation. It should be noted that McAlpine and Schneider included *Ortaloptera* Edwards as an aberrant *Phytalmiini* and pointed out that it was atypical because of the lack of a metathoracic postcoxal bridge; having 2 pairs of strong scutellar bristles; basal area of 2nd tarsomere of mid and hind tarsi less distinct and lobe of cell Cu larger. It should also be noted that the aedeagal apodeme in the male of *Ortaloptera* is fused. I prefer to treat this in the Gastrozona grouping of genera under the tribe Acanthonevrini and will discuss this in my revision of that group.

Robertsomyia Hardy n. genus

Readily differentiated from all known Tephritidae by complete lack of head and body bristles; by having vein Sc extending straight to costa, not upcurved at apex; by lacking an alula and having anal cell very narrow (Fig. 1i).

Head slightly higher than long with lower portion of occiput swollen equal to ½ width of eye. Front comparatively narrow, slightly less than ¼ width of head, gently concave in upper median portion and slightly protruded on lower portion above antennae. With a row of fine, pale, inconspicuous hairs along each eye orbit and with fine pale hairs in occipital row. Interfrontal area bare and shining. Antennae situated near middle of head. Third antennal segment rounded at apex, about 3 times longer than wide and extending nearly ⅔ length of face. Second antennal segment with a row of moderately strong, yellow, bristle-like hairs on apicoventral margin, these extend

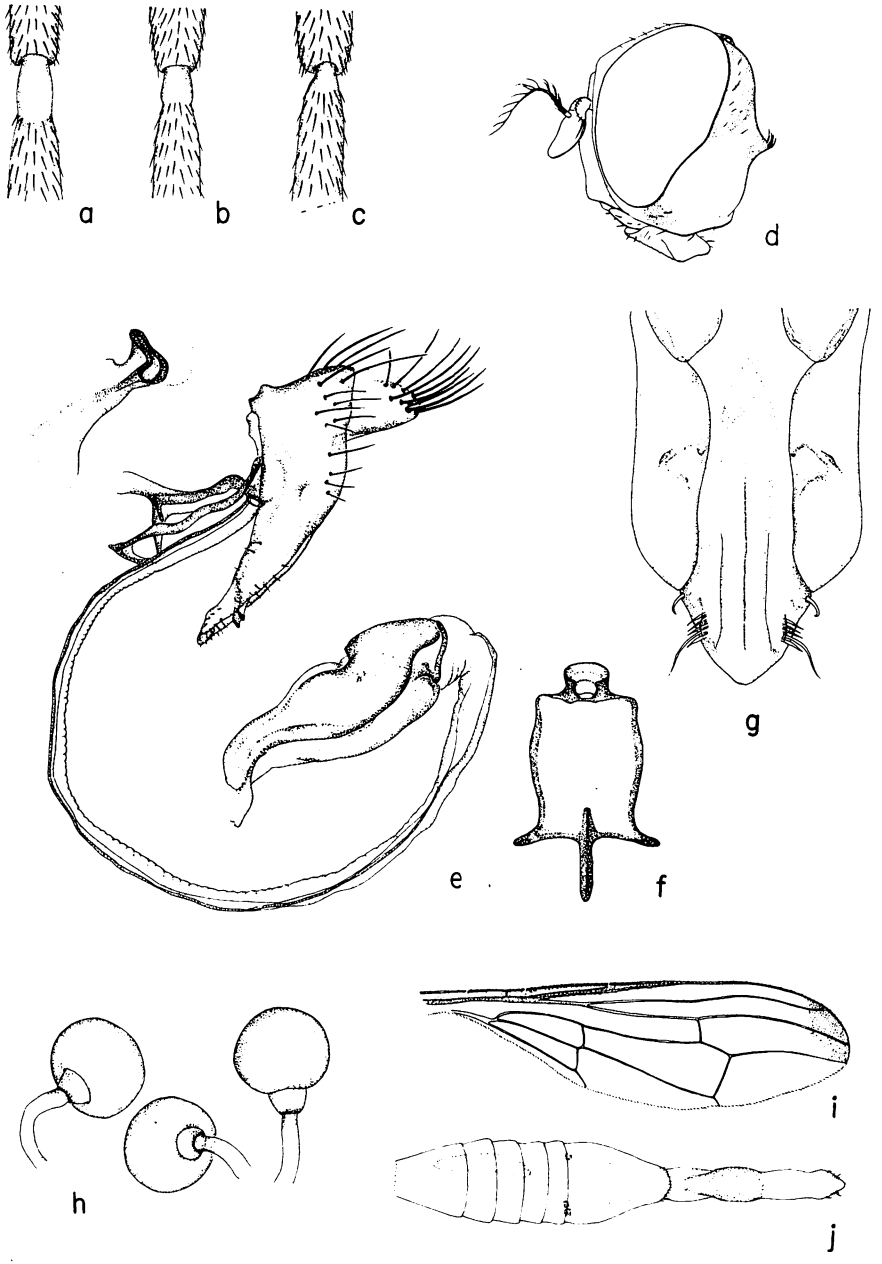

FIGURE 1. a-c, base of 2nd tarsomere of hind legs, dorsal view: a, *Phytalmia biarmata* Malloch; b, *Diplochorda minor* Malloch; c, *Sessilina nigrolinea* (Walker). d-j, *Robertsomyia paradoxa:* d, head, lateral; e, ♂ genitalia; f, aedeagal apodeme ♂, end view; g, apex of ♀ piercer; h, spermathecae; i, wing; j, ♀ abdomen.

approximately ½ length of 3rd antennal segment. Arista haired only on dorsal surface except at base. Face gently convex as seen in direct profile and with a prominent sharp-edged keel extending down middle from between bases of antennae to near apices of antennal furrows. Lower median portion of face gently rounded, almost flattened. Thorax completely bare, devoid of all vestiture except for fine, short, inconspicuous, scattered hairs. Scutellum short, 2 times wider than long and with 2 rather prominent tubercles at apex. Metathoracic, postcoxal bridge broad, completely sclerotized. Legs slender with no distinctive features. Mid tibia with a row of anteroventral, short, reddish brown setae, about equal in size to ventral setae on mid basitarsus and with no distinct spines or bristles present. Wings slender, 4 times longer than wide with veins bare except for setae on R_1 and membrane mostly bare, having microtrichia over apical ⅓ and along posterior margin in cell M_4. Vein R_1 fitting very close to Sc almost obliterating 3rd costal section. Vein R_{2+3} gently sinuate and vein R_{4+5} and M_{1+2} slightly convergent so that cell R_5 at apex is only slightly less than ½ greatest width of cell. Crossvein r-m situated at about apical ¾ of cell lst M_2 and apex of cell Cu forming about an 85 degree angle to basal part of vein Cu. Vein Cu_{1+1stA} about equal in length to vertical portion of vein Cu. Other details of wing as noted above and as in Figure 1i. Abdomen with a distinct keel extending down dorsomedian portion and rather distinctly flattened laterally, nearly two times higher than wide. Male genitalia conspicuous *in situ* and almost vertical to apex of 5th abdominal segment. Features of genitalia as described below and with vanes of aedeagal apodeme widely forked. Female with ovipositor large and typically carried in a upcurved position extending at a 90 degree angle with remainder of abdomen. Basal segment of ovipositor broad and as described under species.

It is a pleasure to name this remarkable animal after Dr. Hywel Roberts, Forest Research Station, Bulolo, who first brought it to my attention and who has collected most of the specimens. I am much indebted to Dr. Roberts for the effort he has put forth in obtaining a great deal of valuable data concerning distribution and biology of fruit flies in the Morobe District, Papua New Guinea.

Type of genus *Robertsomyia paradoxa* n. sp.

Robertsomyia paradoxa Hardy n. sp. (Fig. 1d-j)

Entirely yellow to rufous except for a polished black mark extending over upper median portion of occiput onto upper ⅓ of front, also a polished black mark on hind portion of each gena. Head shaped as in Figure 1d. Third antennal segment white with a faint tinge of yellow, also lower ⅔ of front, lower ½ of occiput and all of face pale yellow-white. Wing hyaline with a dark brown spot at apex covering apices of cells R_5, R_3 and extreme apex of R_1 (Fig. 1i). Otherwise fitting characters noted above with mesonotum and abdominal terga shining. Male genitalia with apex of aedeagus (distiphallus) unusually large, about equal in size to epandrium and surstyli. Cerci rather small, about ⅔ as long as epandrium. Surstyli gradually tapered, slender, subacutely pointed at apices and teeth of 10th sternum prominently exposed (Fig. 1e). Vanes of aedeagal apodeme short, widely separated. As seen in dorsal view apodeme as in Figure 1f. Female 6th tergum about equal in length to 5th, and 7th segment about equal in length to terga 3-6. Piercer broad, equal in length to 8th segment, about 3½ times longer than wide, acutely pointed at extreme apex and as in Figure 1g & 1j. Eggs unusually large, measuring 2.3 mm in length. Three round spermathecae as in Figure 1h.

Length of male: body, 7.8 - 8.2 mm; wings, 7.3 - 7.6 mm. Length of female body, excluding ovipositor: 7.3 - 8.4 mm; wings, 8.0 - 9.6 mm.

The specific epithet is from the latin *paradoxus,* equals strange, contrary to expectations.

Dr. Roberts has reared this species from the stems of live *Bambusia* sp. The series of specimens have been taken between 3000 and 6000 feet, all from areas of bamboo mixed in *Castanopsis* (Oak) forest.

Holotype male and allotype female, Upper Manki Logging Area, 5000 feet, on leaf *Bambusa* sp., 25.I.1983 (H. Roberts). Nineteen paratypes, 6 males, 13 females from the following localities in Papua New Guinea: same data as type, some collected under shrub leaf, 2.X.1982 (H. Roberts) and 1 in sticky trap, 15.XII.1972 (F.R. Wylie and P.S. Shanahan); Manki Logging Area, Bulolo, M. Prov., on flowers *Asystasia* sp., 29.IV.1981 (H. Roberts); Gumi, nr. Bulolo, Watut, M. Prov., 2010 m, on ground vegetation, 13.VII.-27.XI.1979 (H. Roberts and H. Ivagai); Lower Gumi Logging Area, nr. Bulolo, on leaf shrub, 24.IX., 22.X. and 6.XI.1979 (H. Roberts); Kassam, 48 km E. of Kainantu, 1350 m, 7.XI.1959 (T.C. Maa); Sinofi, 30 km S. of Kainantu, 1590 m, 1-6.X.1959 (T.C. Maa) and Arau, 40 km E. of Kainantu, 1400 m, E. of Kainantu, 1400 m, 15.X.1959 (T.C. Maa).

Type allotype and some paratypes in B.P. Bishop Museum, other paratypes deposited in collections of Australia Museum, Sydney; Australia National Insect Collection, Canberra; Forest Research Station, Bulolo; British Museum (Natural History); U.S. National Museum and University of Hawaii.

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REFERENCE CITED

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